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Canadian Journal of Psychology

TIME, VALUES, AND SOCIAL ORGANIZATION¹

J. D. KETCHUM
University of Toronto

Six years ago yesterday, in a moving and memorable Presidential Address, William Line pictured to us a sick society, confused and divided by the clash of values and the impotence of men. He challenged us to do two things: first, to step beyond the borders of our own discipline and possess ourselves of at least the major findings of our sister social sciences; secondly, having thus got our bearings in the Great Society, to state, publicly and unequivocally, the positive human values for which we as psychologists stand.²

He was of course right in coupling the two demands. What we have to say about healthy human living must be said in terms compatible with a societal frame of reference if we are ever to pull our weight in solving the world's problems. Their solution, as we like to say in our more relaxed moments, requires a joint attack by the social sciences, among whom we never hesitate to include psychology for rhetorical and financial purposes. But how much interest do we really show in combined operations? Our potential allies all share, if not a common language, at least a common universe of discourse; two among them, sociology and anthropology, are becoming indistinguishable in their applied forms. Our own statements about the good life, however, when they are intelligible at all to other social scientists, are apt to strike them as hopelessly irrelevant. We no longer base them, it is true, on the assumptions of twenty years ago—assumptions we shared with almost no one save the mechanical engineer. But we still frame them in language which repels our sister sciences, not because it is psychological language, but because it appears to deny the very phenomena with which they are concerned—the phenomena of organization beyond the individual level.

When asked what makes human beings aggressive, intolerant or irresponsible, tense, anxious or neurotic, we answer typically in terms of a concept of motivation which we have really outgrown without knowing it. Man acts as he does, we say, because he has a big bundle of *needs*

¹Presidential Address delivered to the Canadian Psychological Association at London, Ontario, May 30, 1951 (abridged for publication).

²"Psychology and Social Purpose" (*Bulletin of the Canadian Psychological Association*, October, 5, 1945, 55-67).

inside of him; when these are satisfied he behaves nicely, when they are frustrated he behaves badly. The juvenile delinquent needs a swimming pool; the aggrieved worker needs ego-enhancement; Joe Stalin probably needs love.

Such an answer—and I am parodying it only slightly—puts formidable obstacles in the way of any real collaboration. For the very concept of need ties us irrevocably to “the” individual as the major abstraction to which all else is referred, whereas the other social sciences operate at the level of the organized patterns—groups, institutions, cultures—formed by the reciprocal functioning of many individuals.

SOCIAL PSYCHOLOGY IN TRANSITION

There are notorious difficulties entailed in trying to integrate two highly articulated systems of explanation which operate at different levels of analysis. These are most acutely felt, of course, in social psychology, whose figurative position in the struggle is squarely on the 38th parallel. How formidable they are may be gauged by the contortions through which social psychologists are currently going in a valiant effort to face two ways at once. The position is too unstable to be long maintained; urgent pressures from without are arousing intense critical and constructive activity within, and all this foreshadows a reorganization which will make many of our present thought-models obsolete—and not only in social psychology.

The kind of reorganization most widely and persuasively supported is one involving far greater emphasis on perceptual and cognitive processes, and with this suggestion I am fully in sympathy. A cognitively centred psychology will not solve all our problems—there is no danger of our working ourselves out of jobs—but it will finally put social psychology in a position to co-operate effectively with other social sciences without being false to psychological principles. For, whatever one's theoretical standpoint, the fact remains that it is in cognitive experience, not in the realm of needs and drives, that self and other, individual and social, are bound together in a single framework. And that is the obvious point of attack on all our practical problems, psychological as well as social.

A growing emphasis on perception has long been evident in the clinical and applied fields, and most notably in projective tests. Its slowness in penetrating into our theoretical generalizations is partly due to the fact that taking perception seriously in the analysis of molar behaviour involves us in a dichotomy as troublesome as that between individual and social, and even more painful, because it lies in our own back yard. For to attribute a dynamic role to cognitive processes—which is what the

shift really means—at once upsets our traditional notions of motivation. Two types of process have to be given a role in determining, not only behaviour, but also one another, and an adequate statement of their inter-relations is not easy to construct. We may ultimately be driven to subsume motivation under perception, as Hochberg and Gleitman suggest,³ or to abolish both categories in favour of the kind of monistic formulation offered by Krech.⁴ Or we may be able to relate them in terms of a more inclusive system, with MacLeod,⁵ or of new common constructs, with Postman.⁶ Whatever solution emerges—and I am risking no predictions—perceptual and cognitive processes are undoubtedly going to play a much larger role in our thinking.

PERCEPTUAL PSYCHOLOGY VS. NEED PSYCHOLOGY

To regard man's behaviour as a direct function of how he sees himself and his world will clearly enable us to work far more effectively with anthropology and sociology, for the essence of social and cultural experience is the acquisition of particular ways of looking at things. Will it, however, rob psychologists of any distinctive role in the joint undertaking? On the contrary, it will permit us for the first time to play a part that will do us credit as scientists. For in the field of perception we are well armed with valid, tested knowledge, and can give a first-rate account of ourselves in any company. Motivational psychology, on the other hand, is (as we often admit in private) a mess; once we leave the tissue needs of the organism we have almost nothing to offer but scholarly guesswork. Our answers to the simple question, "What do human beings need besides food, sex, and shelter?" are products, not of controlled research, but of insights, hunches, and dictionary-pawing; we offer a job-lot of vaguely suggestive terms which have all the defects of McDougall's list of instincts, but hardly a trace of his careful definition or meticulous weighing of evidence.

Man needs, we say, security of various types, all ill-defined; he needs a sense of adequacy; he needs love in unlimited amounts; he needs to achieve, to create; he needs social acceptance, approval, status, and recognition; he needs to structure his world, to organize his field in meaningful fashion. He needs self-consistency and he needs flexibility; he

³J. E. Hochberg and H. Gleitman, "Towards a Reformulation of the Perception-Motivation Dichotomy" (*Journal of Personality*, 18, 1949, 180-91).

⁴D. Krech, "Notes Towards a Psychological Theory" (*Journal of Personality*, 18, 1949, 66-87).

⁵R. B. MacLeod, "Perceptual Constancy and the Problem of Motivation" (*Canadian Journal of Psychology*, 3, 1949, 57-66).

⁶L. Postman, "Toward a General Theory of Cognition" in J. H. Rohrer and Muzafer Sherif, *Social Psychology at the Crossroads* (New York: Harpers, 1951), 242-72.

needs a sense of freedom and self-determination, but also responsibility and obligations towards others. He needs self-actualization, ego enhancement, self-esteem, a sense of personal worth; at the same time he needs to lose himself in belongingness, participation, and identification with others.

Terms such as these have, of course, no explanatory value, since the alleged "needs" are merely descriptions of certain types of behaviour. None the less, I have not put them down as evidence of intellectual bankruptcy. On the contrary, I think that this list, garnered from current attempts to make sense of molar behaviour, shows that we are at least groping our way towards the kind of reorientation we require. The change of focus is of course concealed by uncritical use of the term "need," but its traces are quite apparent. For one thing, as we have moved away from physiological needs towards what may be called psychological ones, the increasing emphasis upon social needs has become unmistakable; for another, many of these needs might well be termed "perceptual," in that they refer to ways in which the individual views himself and others. And this drift towards cognitive formulations becomes clearly visible in such needs as those for organization and meaning.

In other words, if one were to attempt a harmony or synthesis of such a list, what would emerge would have little resemblance to the organism which confronts us in Chapter I of every introductory text; it would look much more like an individual whose behaviour reflects his position as a functioning unit in society. It is true that psychologists still exhibit the startle reflex when they come face to face with a social structure, and make haste to resolve it into its individual components by such phrases as "other persons." But with the current emphasis on organization in perception, learning, and personality, we may soon be courageous enough to look at man's social contexts also in organizational terms, with all which that implies as to their dynamic and perceptual properties.

It is the modest aim of my rather rambling remarks today to supply a little encouragement in this general direction. Hence I shall not come up with a new list of needs, nor yet, God forbid, with one basic, fundamental need to replace all the others. That has been done too often, and it does not make for clarification or consensus. Instead, I am first going to discuss a dimension of cognitive experience which has been somewhat neglected in recent psychology, but which seems to me a central feature of man's psychological relationship with organized social groups. Then I shall touch on one or two specific problems in this field which it would be interesting to attack from a perceptual, rather than a motivational, standpoint. They are difficult problems, but psychologists are uniquely well equipped to tackle them.

THE TIME DIMENSION IN HUMAN EXPERIENCE

The first point I want to make concerns the critical importance of the time dimension in human cognitive experience, and particularly in social perception.⁷ If a perceptual approach to molar behaviour sometimes appears superficial, lacking that "depth" which we associate with the so-called dynamic psychologies, it is mainly because our experimental methods have led us to ignore the time dimension. Once that is introduced, perceptual analysis becomes anything but shallow.

Man, as we often say, does not live only in the present; past and future are constantly involved in his cognitive experience, and thus—if we ascribe any dynamic role to perception—in the determination of his conduct. But, while genetic psychology and psychoanalysis have promoted the past to a dominating position in our thinking, the same is not true of the other end of the continuum, the future. It is generally ignored, partly because of our terror of anything that resembles teleology, partly because of the apron strings which still tie us to our formidable foster-mother, physiology. For the future, after all, cannot leave any nerve traces. And hence the paradox recently stated by Gordon Allport: "While most people are absorbed in planning for, working for, and dreaming for, the future, psychology for the most part is busily engaged in tracing their lives backwards."⁸

Even the list of needs which I cited earlier, however, suggests that our position in this respect is changing. For, while the phenomena denoted by the term "need" are logically present and transitory, a number of these alleged needs clearly contain a future reference. This is obvious in the case of such needs as security, adequacy, and achievement, and certainly implied in those that refer to the stable organization of the field or the personality. Nor is this surprising, for we cannot escape the future; its significance strikes us the moment we take off our theoretical blinders and look at human life as we actually find it. There are, as Dewey says, "moments of consummation when before and after are legitimately forgotten,"⁹ but these are rare and fleeting. Even in love, perhaps the purest example of an experience totally comprehended within the "now," the future cannot be excluded; "Do you really love me?" is inevitably followed by, "Will you love me always?" The fears of the deeply disturbed children in Bettelheim's school are nearly all fears for

"Perception" is used broadly, here and elsewhere, to refer to the cognitive apprehension of any phenomenal experience.

⁷G. W. Allport, *The Individual and his Religion* (New York: Macmillan, 1950), 130.

⁹John Dewey, *Experience and Nature* (Chicago: Open Court Publishing Company, 1926), 28-9.

the future; it is significant that he calls his little book, "Love is Not Enough."¹⁰ On the less emotional side no evidence is necessary; scarcely any of our everyday, organized behaviour is intelligible apart from its future references.

None the less, we students of human behaviour have long ignored its dependence upon a perceived or apprehended future. We were bound to do so, of course, while we were held in the fetters of a stimulus-response formula, but even when we escaped into situationism we did not exploit our freedom. Our "total situations" turned out to be little more than stage scenery; visually tri-dimensional, admittedly, since depth perception was a respectable topic, but entirely lacking the dimension of greatest importance to man, that of time-depth or duration.

TEMPORAL ORGANIZATION AND VALUES

For man, since he achieved self-consciousness, has always sought, not only satisfaction in the present, but assurance for the future; he is forever trying to escape from the knife-edge of the present into a context that appears more stable and predictable. This goal seems to be unique to man, and so is the method by which he attains it—his unique capacity for temporal organization. Through this he achieves, not the mystic's escape into the timeless, but something more significant—the binding together of past, present, and future into a single cognitive structure. That structure, because of its temporal extension, its forward and backward references, possesses stability; like a thousand-foot liner, it spans many of the waves of change at once, and so is relatively undisturbed by them.

Emotional security, a sense of partial immunity from time and change, is one obvious product of man's temporal organization, but there are others, perhaps more important. For it is only as we escape from the prison of the present that we are able to conceive what we call values, and thus to discover some meaning in existence. This may be simply illustrated by considering the temporal organization involved in perceiving a spoken sentence, a short musical tune. Beginning, middle, and end are apprehended together, not as discrete experiences, but as one whole; and this not by some intellectual jugglery, but immediately and directly. Time is not abolished, it is an integral quality of the experience; but it is gathered up or telescoped so that all parts of the sentence or tune are in some sense contemporaneous. The beginning is still phenomenally present when the end is reached, and the end potentially present from the beginning.

¹⁰Bruno Bettelheim, *Love is Not Enough* (Toronto: Burns and MacEachern, 1950).

And these time-extended wholes are found to possess meaning not present in the parts experienced separately; the sentence signifies something, the tune has aesthetic value. At the same time, each syllable or note acquires, as part of the whole, meaning and value which are lacking in isolation; it displays new perceptual properties. And all these significant emergents are dependent on the time-binding character of the organization, the island of stability which it creates in the ever-flowing stream of change.

TIME PERSPECTIVE AND SOCIAL ORGANIZATION

If we turn now to the social organizations of which man is himself a part, we find that the same principles operate, and with added significance. Human groups are organized, not only spatially, but temporally; they are extended in time and involve a reference to the future. Only so could they be a source of values, for no value except the satisfaction of immediate bodily needs is conceivable without a future reference. The values appearing with group organization, however, are social rather than aesthetic values; they are not merely enjoyed, they also determine conduct. Hence, when human beings are themselves organized together, the future is not only cognitively experienced, but also brought under positive control, in so far as it depends on human actions. This higher predictability is the primary source of the security felt in group-belongingness; acceptance, recognition, and status *now* would mean little were they not reflections of shared values and thus conditional guarantees of a satisfying future. And similarly, it is only within the time-extended frame of reference which group life supplies that our trivial daily acts and strivings acquire any importance or meaning.

These points will appear more concretely if we observe a short and temporary example of social organization. A group of boys haphazardly kicking a football around are not organized, or at least not stably organized. Their behaviour is undoubtedly motivated, need-fulfilling, but what they are doing has no great significance to them and arouses little effort or ego-involvement. Organize a game, however, and the whole picture changes. We now have two sides, each divided into a number of specifically related positions, that is, a social organization with two sub-systems. And what happens? The boys begin to exert themselves, to put all they have into what they are doing, to participate, in Gordon Allport's sense. At the same time, their every act is directed and controlled by a set of values and standards which have become operative, and to which each individual feels he must conform. There is strong motivation, but the goals are shared goals, and ego-drives in the narrow sense are subordinated. In short, we have here in miniature a picture of the good

needs reflection desperately! Cf. Alan Watts, The Way of Zen and Kierkegaard's The Uncommitted

society, the good citizen, and also, we may feel sure, of the mentally healthy individual. How shall we account for it?

Is it because each individual's needs are now being satisfied? That will take us nowhere, for they were being satisfied before the game began. We are on surer ground if we use a cognitive analysis, for the change is clearly in the individual's perception of the group's activities and his own share in them. They have acquired a meaning they did not previously possess; the acts of kicking, tackling, and running no longer seem trivial, but important. And from this perceptual shift has come the change in motivation—the individual's ego-involvement, his eagerness to devote his energies and invest his skills.

How was this perceptual change caused? It is of course a result of organization, of the new structure that has been formed; the parts gain significance from the whole. So much is familiar to us. But let us note the temporal aspects of this organization rather than the spatial. Nothing that is going on could have much meaning if it were not perceived as part of a whole extended in time, having a beginning and moving towards an end which will represent closure, completion. When another boy comes up and tries to join in he is warned off with, "Hey, get out—this is a game!" Not "this is a team," but "this is a *game*"—a temporal whole, cognitively present to the speaker. To be a game it must run its full course, but that can be predicted because the behaviour of the players is controlled by the values of football. The significance of the future reference is still clearer if the organization is made more complex, if the single game is itself part of a longer temporal system, a league. At once we find the meaning and importance of what is occurring enhanced, with a consequent increase in effort and participation. And this enhancement is clearly due to the time-organization being extended to include the whole season.

I think one could easily demonstrate that if the completion of an informal game is rendered doubtful, say by approaching darkness and the departure of some players to supper, there is a proportionate loss of meaning, less real participation, and more disregard of the guiding values and norms, signalized by shouts of "Aw, come on, play the game!" And I suspect that when two faculty chess-fiends start a game at ten minutes to two, knowing that they cannot finish it, they are less ego-involved and play more riskily, that is, with diminished regard to the objectives and values of chess.

Many examples come to mind of the weakening of social values and controls when *time-perspective* is reduced and men begin to live mainly in the present. Robert E. Park long ago related the excesses of crowd behaviour to the fact that the crowd has no past and no future, and

exists only in the present.¹¹ There is also the frequently reported disorganization of primitive communities on the death of the ruler; among the Baganda, Murdock tells us, "the death of the king . . . plunges the entire country not only into mourning, but into anarchy. . . . The weak hide their possessions, the strong ravage the countryside."¹² The loss of moral control in military camps is probably due more to the shortness of the foreseeable future than to the men's removal from home ties. And much current marital behaviour could be similarly interpreted; once the relationship is perceived as of uncertain duration, the partners act more in terms of momentary feelings, less in terms of stable values. What we require are a few controlled experiments, analogous to the familiar work with unstructured situations, in which the lack of structuring would be temporal rather than spatial, in the form of uncertainty in the time dimension. Such experiments would be easy to design, and I think we would find social controls weakening, functional factors taking the upper hand, and suggestibility increasing.

SOME CURRENT SOCIAL PROBLEMS

What I have been saying may help us to see why the disorganization of historic human groupings by industrial development has had such drastic effects on modern man. For family, kinship group, and community, besides their obvious instrumental functions, have always performed psychological functions quite indispensable to man's inner peace and the control of his conduct. While they remain stable he can live in a wider time-span than the present, and hence discover values which give his life some meaning. These groups have not been destroyed, as is sometimes asserted, but they have been changing at a speed which robs them of perceptual stability; predictability is curtailed, old values lose their force, and a thousand problems of mental and social malfunctioning threaten to overwhelm us. But man, exposed naked to the bleak winds of change, does not sit idle; he hurries to repair the damage as best he can by creating and joining the innumerable new organizations—national, industrial, professional, educational, athletic, religious, social, fraternal—which have proliferated so amazingly in modern civilization. Some of this group activity may appear ludicrous, but it all rises from a valid source, for the construction of stable relationships with others represents for man his only victory over time. A partial victory only, of course, but it is the best he can do, and sufficient to make his brief life meaningful.

¹¹Unpublished lecture notes, Department of Sociology, University of Chicago.

¹²G. P. Murdock, *Our Primitive Contemporaries* (New York: Macmillan Company, 1936), 530.

Few of these new social groupings have yet attained the stability of those they have replaced, and it is in man's relations to them, and in their own inter-relations, that we find most of our present problems. In closing I want to mention one or two of these problems which offer interesting possibilities for perceptually orientated research by psychologists.

The first is that of the relationship between actual changes in a social organization and the perception of these by the members. Arensberg has recently touched on this problem in arguing that the familiar symptoms of industrial malaise—restriction of output, complaints and grievances, high turnover, and the like—are all attributable to changes in the organizational pattern, shifts in the total configuration.¹³ On reading his article, I was reminded of a study in our own department, in which the unrest in a plant which had grown very rapidly had to be put down to the frustration of a variety of workers' "needs," mainly because we lacked any alternative formulation. And yet, when the older workers were interviewed it was clear that the problem was basically a perceptual one; what they said in effect was that the plant had changed, that it was no longer the same place to work in.

This opens up a tempting problem in a field in which psychology is well equipped, that of perceptual constancy. Even the strongest social structures are today in constant change, but sometimes the changes are acutely felt and sometimes not. Management may introduce pensions, welfare schemes, and many similar changes without affecting the unfavourable perceptions of their workers; on the other hand, a single unimportant gesture can sometimes precipitate a far-reaching reorganization. How much objective change is possible without so disturbing the member's time perspective that his cognitive structure becomes unstable and has to be radically reorganized? Or, better, what are the conditions under which specified changes can be introduced so as to alter perceptual structures or leave them intact, whichever is required? We have a great deal of potential evidence from field studies of worker morale, and it might pay us to reinterpret it without reference to assumed needs, along lines suggested in Gestalt theory.

This leads us to a second problem. It is now well accepted that we get our values and standards from perceiving ourselves in relation to organized social groups. All of us, however, belong to many such organizations; what happens when their values compete or conflict? This problem of multiple group membership has been given a valuable expo-

¹³Conrad M. Arensberg, "Behavior and Organization, Industrial Studies" in Rohrer and Sherif, *op. cit.*, 324-52.

sition by Hartley,¹⁴ and was earlier treated by the anthropologist Linton.¹⁵ It is specifically a psychological problem, however, since the competing value-systems can come to grips only within the individual. We have made little progress on it by talking about identification and reference groups, for we do not yet know what determines identification. From the standpoint of this paper it is strictly a problem of perceptual dominance, and the phrase at once recalls the familiar Gestalt principle that the "good Gestalt" tends to dominate the field at the expense of weaker structures.

The "good Gestalt," however, is a somewhat elusive concept even in visual perception, and translating it into social terms is difficult and hazardous. For we are here concerned with perceptions of a uniquely complex type, in that they always include the self-picture of the perceiver. This intrusion of the ego tempts us to define the good Gestalt functionally, in terms of need-satisfaction, but that, of course, would bring us right back to where we started. Let us try, rather, to stick to structural dynamics, even if it turns out that they cannot carry us all the way. From that standpoint, the common characteristic of all good Gestalts is their perceptual stability—and this has an encouraging sound. For stability introduces the time dimension, the factor we have proposed as the chief source of group influence over the individual.

When we examine the stability of social organizations, however, we are forced to recognize two significantly different types. There is first what might be called "natural" or "emergent" stability, characteristic of systems which have reached their optimum form through the resolution of tensions and the attainment of equilibrium. We find this wherever the relationships involved have been so fully worked over in free communication that consensus has been reached about relative roles and status. No human group, of course, can achieve the stability of an isolated visual circle, for internal and external changes give rise to new tensions which demand appropriate restructuring. But wherever relative stability has been achieved through unhindered reduction of tension, we seem to find a high degree of identification and participation among the members, and hence a full release of their individual capacities.

Social stability, however, may also be of a formal or "imposed" type, when the pattern of organization is frozen in a form determined by tradition, by considerations of efficiency in the narrow, non-human sense,

¹⁴Eugene Hartley, "Psychological Problems of Multiple Group Membership" in Rohrer and Sherif, *op. cit.*, 371-87.

¹⁵Ralph Linton, *The Cultural Background of Personality* (New York: Appleton-Century-Crofts, 1945), 80-2.

by the fact that it is perceptually satisfying to a powerful minority, or by some combination of such factors. This freezing of structure is of course accomplished by restricting the channels and content of communication, as in most formal social organizations. The free reduction of strains and tensions is obstructed, with familiar consequences in the perceptions, emotions, and behaviour of those affected by them.

Can we go so far as to assert that the good Gestalt, socially speaking, is the stable group or organization, provided that its stability is the continuing product of the interplay of natural forces, and not of their blocking by artificial barriers? It is an attractive assumption, and it should be tenable, for, as Hartmann has pointed out, "both Prägnanz and closure imply that the 'good Gestalt' is the terminal goal of all organizing forces in nature."¹⁰ That phrase should certainly include social forces.

Will this interpretation of the good social Gestalt enable us to deal with the problem of perceptual constancy under objective change? We have a growing amount of evidence that in groups where communication is unrestricted drastic changes can be introduced without altering the members' favourable perceptions of the group. But we must also explore the high resistance to change shown by many unfavourable perceptions in groups whose stability is an imposed one.

It would be over-bold to say that the good Gestalt in our sense dominates the field in the case of multiple group memberships, for there are many factors involved in identification, and some of them may be refractory to statement in perceptual terms. But certain of the findings on the relative influence exerted by formal and informal groupings in industry, by the freely structured gang and the "frozen" school structure, are at least suggestive of an affirmative answer. This is another area where specifically directed research might have exciting results.

PRINCIPLES OF GROUP DYNAMICS

We have now arrived, by a long but I hope not uninteresting route, at a point which I had no intention of touching when I began this paper, but which my graduate students could probably have predicted in advance. For the assumptions we have just been weighing are of course the underlying principles of the Lewinian school of Group Dynamics, implied, though often rather obscurely, in most of their published work, and put into practice with tireless enthusiasm at their summer training laboratory at Bethel. They are also in essence the assumptions on which Robert Bales has constructed his ideal model of group interaction.

¹⁰G. W. Hartmann, "The Gestalt View of the Process of Institutional Transformation" (*Psychological Review*, 53, 1946, 287).

What do they add up to as a statement of positive values for human living? Simply that human beings function best, psychologically and socially, when they can perceive themselves as integral parts of social structures which are both stable and flexible. Stable, in that they permit the member to organize his perceptions temporally, to achieve an adequate time perspective; flexible, in that they are responsive to every emergent tension, allowing its orderly reduction through communication.

This may be far from your idea of the gospel according to psychology, but let us not overlook three features of it. First, that we arrived where we did, not by deduction from broad sociological generalizations, but by trying to follow a path of thought whose origin and most of whose course lay in respectable psychological country. Secondly, that most psychologists who deal with mental and social casualties are working, whether they know it or not, on precisely these assumptions. They seem to me to give far too little thought to the wider social contexts of their patients, but the non-directive interview is an almost perfect example of the "good Gestalt" as I have described it, and so is anything that deserves the name of a therapeutic group. And finally, though this is relevant to us only as citizens, let us note that in trying to formulate some positive values for psychology I have also come close to stating the true meaning of democracy.

RECENT ELECTROPHYSIOLOGICAL STUDIES OF THE CEREBRAL CORTEX: IMPLICATIONS FOR LOCALIZATION OF SENSORY FUNCTIONS

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DURING the past twenty-five years considerable work has been done on the problem of localization of sensory functions in the cerebral cortex. In general the results have not been too clear. The purpose of the present paper is twofold: First, we wish to call attention to the experimental procedures used in past research on localization. Secondly, we hope to show that by taking into account some recent electrophysiological studies of the cortex the problem of localization of sensory functions can be made much clearer.

Two major approaches to the study of localization were formerly made. The first, used mainly in the studies of higher animals, involved the removal of sensory areas of the cortex which were mapped out by anatomical means (cytoarchitectonic and retrograde degeneration methods). The second, confined exclusively to rats, consisted of placing lesions in such a manner that virtually the entire cortex was explored. The area which was then found common to all impaired animals was considered the region in which the particular sensory function studied was localized. This obviously inadequate procedure was resorted to because of a lack of satisfactory information on the probable locus of sensory areas in the cortex of the rat.

Even aside from the special case of the rat, these approaches fell short of their objective because the anatomical data do not provide sufficiently clear delimitations of the main sensory areas. Disagreements resulted and our present knowledge remains incomplete. We do know that certain visual processes are localized in the occipital cortex. However, we can determine only the approximate location of areas subserving other sensory functions. The localization of cortical centres for hearing has been demonstrated, but the results on the whole are not in good agreement. Only a beginning has been made on the study of tactual functions and little has been done on the other senses.

Fortunately, a new approach to the problem of localization is offered by recent electrophysiological studies which have mapped the sensory areas by recording cortical potentials evoked through peripheral sense organ stimulation. These studies, giving us for the first time a clear picture of the location of the sensory areas, possess such great possibilities for resolving many of the contradictory results of the past and for suggesting future lines of attack that they warrant some discussion.

EVOKED POTENTIAL TECHNIQUE

Since the advent of the radio in the 1920's, much progress has been made in the development of sensitive amplifying and recording apparatus. Two main electrical recording techniques have become available: the earlier and familiar electroencephalographic and electrocorticographic procedures which register the spontaneous potentials of the cortical cells—potentials believed to be associated with metabolic processes; and the less well known evoked potential technique which records cortical potentials produced by peripheral sensory stimulation. Accompanying this development in instrument design, great advances have been made in the investigation of the functional activity of the cortex in terms of the electrical phenomena accompanying such activity.

The evoked potential technique originated in 1933 in the observation by Gerard *et al.* (6) that the displacement of a few hairs on the body of an animal gives rise to a localized (evoked) potential in the contralateral cerebral hemisphere. Little use was made of the method for mapping sensory areas of the cortex until the 1940's. Possibly this delay was due to the enthusiasm for the EEG during the intervening period. It may be of interest to describe the evoked potential technique more fully.

The procedure for mapping some sensory system such as somesthesia is as follows: The skull and the dura are opened so as to expose a large part of the surface of either one or both hemispheres. Small adjustable electrodes are placed on the pial surface, one on a point on the cortex and the other on some indifferent area such as the skull. A mechanical vibrator is then applied to the tactile sensory endings of the skin in a systematic way over various parts of the body surface. The potential differences which develop between the electrodes are recorded by means of an amplifier and a cathode ray oscilloscope. Two mapping procedures have been employed. In the first, the cortex is explored millimeter by millimeter, and for each cortical point examined, the cutaneous area activating that point is defined and transformed into figurine charts. In the second method, a fixed area on the skin is stimulated while the recording electrode is moved point by point over the cortex. The area of maximal electrical response on the cortex is considered the primary area representing the peripherally stimulated region of the body surface. Substituting photic or auditory stimuli for the mechanical vibrator enables one to delimit the visual and auditory areas of the cortex in similar manner.

RESULTS OBTAINED WITH EVOKED POTENTIAL TECHNIQUE

Until recently it was believed that each of the main afferent systems had one major pathway into the cortex. The method of evoked potentials,

however, has yielded the unexpected information that touch, vision, and hearing are at least *doubly* represented in *each* cerebral hemisphere. Woolsey (20), the investigator who has carried out most of these mapping studies, suggests that these dual cortical afferent systems be referred to as somatic areas I and II, visual areas I and II, and auditory areas I and II. This terminology carries with it no functional or anatomical implications and it can be applied to each of the three sensory systems. Moreover, area I corresponds to what has been considered the primary projection area of each system. In each case, area II was "second" in time of discovery.

The somesthetic areas of the cortex were the first to be mapped by the electrophysiological method. Various animals have been studied—among them the rat (21), cat (20), dog (19), sheep (20), and monkey (19, 22). In each case two somatic areas have been found. What appears to be evidence of a second somatic-sensory area in man is indicated by some observations of Rasmussen and Penfield (9). A number of their patients experienced sensations referred to the face, arm, and leg upon stimulation along the lip of the Sylvian fissure.

Somatic area I corresponds fairly well with the postcentral gyrus of the monkey (Brodmann's areas 3-1-2) and its homologue in other animals. The fundamental pattern of representation of skin surfaces is basically the same in all species. However, the degree of development of the various portions of the basic pattern differs from species to species; for example, in the pig (20) there is a very large snout area with a poorly developed hand and foot area, while the converse is true in the monkey (22). In somatic area I the relation of skin surface to cortex has been found to be strictly contralateral with the exception of a part of the face area. The pattern of localization within the area is very detailed. Each cortical point in area I is *optimally* related to some particular area of the skin surface, giving a "point-to-point" projection. Although this "point-to-point" relationship is present, there is considerable overlapping of the representations of the various portions of the skin surface. This overlapping is especially prevalent in rodents (see Figure 2), but decreases as one ascends the phylogenetic scale.

Unlike somatic area I, the second area receives impulses from all parts of both sides of the body, but largest potentials are evoked by stimulating the peripheral parts of the body. Responses resulting from contralateral stimulation are approximately twice as large as those produced by ipsilateral excitation of a corresponding area of the skin surface. The representation of the body surface is the reverse of that in somatic area I, that is, in passing from the free surface towards the insula the order is face, arm, leg. This makes face areas I and II contiguous. Although

somatic area II is differentiated into face, arm, and leg areas the degree of overlap is much greater than in somatic area I.

Duality is not limited to the cutaneous system; it is also present in the visual and auditory sensory modalities. These modalities, however, have not been as extensively studied as somesthesia. In the rabbit (15) and cat (13) photic stimulation produces potentials in Rose's areas striata, parastriata and occipitalis. In this region the contralateral visual field is twice represented in such a way that the two projections—visual areas I and II—are roughly mirror images of each other. Recently Talbot (14) has reported the presence of a third visual area in the cat. This area does not show the topographic specificity of areas I and II.

Again using the evoked potential technique, Woolsey and Walzl (23) have discovered two auditory areas in the cat's cerebral cortex. A sound, if sufficiently intense, activates, besides the familiar auditory area in the Sylvian gyrus, a distinct, inferiorly placed area in the posterior ectosylvian gyrus. These two auditory areas have also been found in the rat (8), dog (16) and monkey (24). As in the case of vision and touch, the pattern of localization (frequencies) in auditory area II is the reverse of that in area I. Recently, Tunturi (17) has located a third auditory area in the dog in the ventral end of the ectosylvian gyrus. A spatial pattern of localization was not clearly evident although there was a tendency for the low frequencies to evoke larger potentials from the anterior and superior portion of the area and high frequencies from the posterior and inferior region. Since this third area lies in the midst of Woolsey's somatic area II, the entire auditory picture appears confused.

Corresponding to the dual sensory systems of the cerebral cortex, Snider and Stowell (12) have recently found a similar state of affairs in the cerebellum where a dual projection of the cutaneous system to the paramedian lobules and the anterior lobe—lobulus simplex—has been revealed. Thus it seems as if a dual principle of organization pervades the afferent nervous system.

COMPARISON OF ANATOMICAL AND PHYSIOLOGICAL MAPS

So far we have discussed the mapping of the sensory areas of the cortex by means of the evoked potential method. Let us now compare the two types of maps—anatomical and physiological. Figure 1 shows the sensory areas of the rat's cortex based upon retrograde degeneration studies. Figure 2 indicates the location of sensory areas of the rat determined by the evoked potential method. The two figures, representing the results of two techniques, give startlingly different pictures of the rat's cortex. Agreement is greatest for vision; even here, the physiological method shows that the visual area extends over a larger cortical region

than was formerly believed. Discrepancies are most striking for audition and somesthesia. Not only do the auditory and somesthetic areas fail to correspond in extent, but each is composed of two sub-areas—auditory areas I and II, and somatic areas I and II. It is interesting to note that auditory area II is located some distance from auditory I. Since the former area lies within somatic area II it may correspond to Tunturi's (17) third auditory area lying within somatic II of the dog.

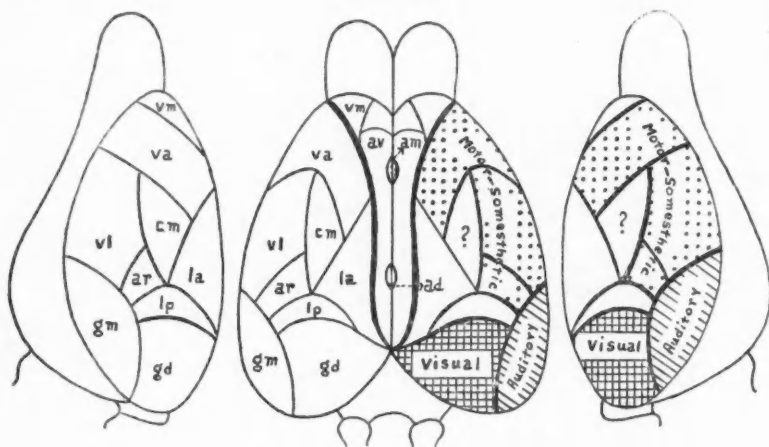


FIG. 1. DIAGRAM OF THE AREAS OF THE RAT'S CEREBRAL CORTEX DRAWN ACCORDING TO THE NUCLEI OF THE THALAMUS FROM WHICH THEY RECEIVE PROJECTIONS (After Waller, 18)

The left half of the diagram shows the projection areas of the cortex. Notations used are as follows: ad, anterodorsal; am, anteromedial; ar, arcuate portion of the ventral; av, anteroventral; cm, centrum medianum; gd, lateral geniculate; gm, medial geniculate; la, lateral; lp, lateral, pars posterior; va, ventral anterior; vl, ventral lateral; vm, ventromedial.

The right half of the diagram shows the areas considered to be sensory in nature. The motor and somesthetic systems in the cortex are believed to involve considerable anatomical overlap and so are not depicted separately. It is not known whether nucleus centrum medianum is sensory in nature or not. Should this nucleus be sensory, the somesthetic area would be larger than shown in the diagram.

Figure 3 shows the locus of the sensory areas in the cortex of the cat. Diagram A indicates the areas thought to be sensory in nature on the basis of cytoarchitectonic methods; diagram B indicates the areas judged to be sensory on the basis of the evoked potential technique. Comparison of the diagrams again shows some striking differences. Not only are touch,

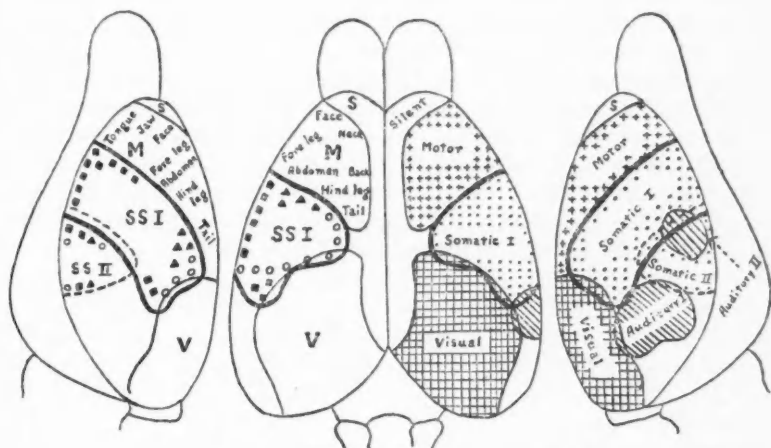


FIG. 2. SENSORY AND MOTOR AREAS OF THE RAT'S CEREBRAL CORTEX AS DETERMINED BY ELECTROPHYSIOLOGICAL TECHNIQUES (based on data of Woolsey, 8, 21, 25 and personal communication).

All of the sensory areas were mapped by means of the evoked potential technique. The motor area was delimited by electrical stimulation. All recording was done under prolonged pentobarbital anesthesia. The visual and auditory areas show a slight degree of overlap posteriorly. Both areas overlap somewhat the adjacent portions of the somatic areas. Whether these overlaps indicate anatomical intermingling or have arisen from the method is not known as yet.

The notations used are as follows:

"Silent" area (S)—in the orbito-frontal region. No evoked potentials of any kind could be recorded in this area. Electrical stimulation was also ineffective.

Motor area (M)—results of threshold type stimulation (60 cycle A.C.) monopolar electrode on cortex, indifferent on abdomen or tail.

Somatic area (SSI)—relationship of cortex to skin is contralateral.

Somatic area II (SSII)—relationship of cortex to skin is bilateral. The pattern of representation within the somatic areas is indicated as follows:

- Face-head areas
- ▲—Arm areas
- Hind leg areas

Visual area (V)—mapped by gross photic stimulation.

Auditory area—the two hatched areas indicate the regions of maximal response to click stimulation of the ear. The larger of the two corresponds quite well with the anatomical location of audition. The smaller area, lying within somatic area II, may correspond to Tunturi's (17) third auditory area.

vision, and hearing doubly represented in the physiological map but their location in the cortex does not correspond to the locus of the sensory areas in the anatomical map. Visual areas I and II in diagram B extend much further anteriorly than do the anatomical visual areas, closely approaching the somato-sensory region of the cortex. In the cytoarchitectonic map the somesthetic areas, like those of vision, are much smaller. Perhaps the most striking difference of all appears in the auditory map. The evoked potential technique indicates that most of the ectosylvian gyrus is auditory in function. This area is completely omitted from the anatomical map of the auditory region.

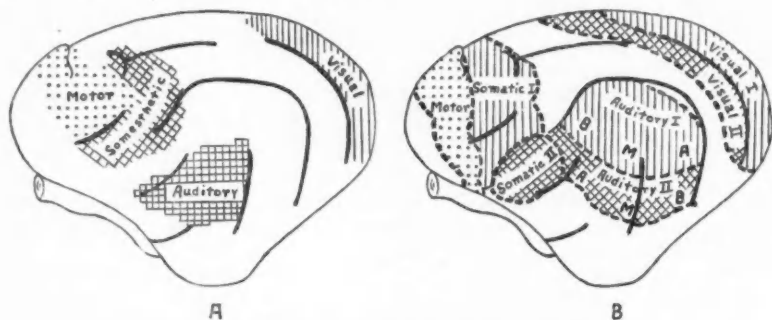


FIG. 3. SENSORY AND MOTOR AREAS OF THE CAT'S CEREBRAL CORTEX

Diagram A: Sensory and motor areas as determined by cytoarchitectonic methods (2). Diagram B: Sensory and motor areas as determined by electrophysiological techniques (20). Hatched areas show the extent of the first somatic sensory, visual, and auditory fields as determined by the evoked potential method. Crosshatched areas show the second somatic sensory, visual, and auditory fields as defined by the evoked potential technique.

The letters B, M, and A in the auditory areas indicate the areas of projection of the basal, middle, and apical parts of the basilar membrane of the cochlea. The tonotopic arrangement in area II is the reverse of that in area I. Visual area II is related to visual area I, roughly as a mirror image.

SOME GENERAL CONSIDERATIONS

From the above discussion it is quite apparent that the classical anatomical methods and the recent physiological techniques furnish quite different pictures of the sensory areas of the cortex. It would be unwise to say that the electrophysiological maps are right and the anatomical maps are wrong. As yet hardly any use has been made of the evoked potential charts in studying the cortical basis of sensory functions. Most of the work during the past twenty-five years has employed the anatomic maps. Until the more recent guides are used in research on

sensory functions, only tentative judgments regarding the relative merits of the two maps may be made. The newer physiological maps, however, have two main advantages: (1) They are *functional* maps, and, as such, are probably better guides to the cortical areas important in psychological functions than are the anatomic ones. Anatomical methods often do not reveal the existence of areas or of pathways that are in fact there, or they may mislead one into placing special emphasis on an area or pathway that seems especially prominent. (2) They are detailed maps and therefore tell us a good deal more about the organization of the different sensory areas of the cortex; for example, the auditory map shows where different frequencies are localized in the cortex.

With these physiological maps available, the problem of localization becomes much clearer. We can now ask: (1) What aspects of sensory behaviour do these physiological areas mediate? (2) Does the dual cortical representation in each of the sensory systems mean that different sensory functions are localized in each of these sub-areas? (3) Can we localize certain sensory functions right down to small sections of sub-areas that receive impulses from the small portions of the receptor surfaces used in sensory processes?

To date, little attempt has been made to answer any of these questions with the use of physiological maps. Considerable speculation has gone on regarding the possible functions of the dual areas. Woolsey (20) has made three interesting suggestions: (1) Since there are rods and cones in the retina and these are accompanied by scotopic and photopic vision, could it be that photopic vision is mediated by visual area I and scotopic vision by visual area II? (2) We do know that there are two kinds of auditory nerve fibres—the radial and the spiral. Do these send their “messages” respectively to auditory areas I and II? (3) Could it be that Head’s (7) postulated dual system of peripheral nerve fibres—epicritic and protopathic—are related to somatic areas I and II? These suggestions of Woolsey are extremely thought provoking. It should be possible to answer them by experiment.

One of the interesting features of the second sensory areas is that they appear to be not only sensory but also motor in nature, that is, stimulation of these areas produces movements of various organs of the body. Garol (5), stimulating within somatic area II, was able to evoke movements of face, arm, and leg. Furthermore, in stimulating a region in the ventral part of the ectosylvian gyrus (part of auditory II), he was able to elicit ear movements. It has been known for some time that in addition to movements in somatic area II and in auditory area II, eye movements and changes in pupil size can be elicited from areas 18 and 19 (corresponding to visual area II).

This sensori-motor nature of the secondary areas may furnish a clue to their function in the organism. It suggests that these areas may be concerned with the motor end of attention. Attention is generally considered to involve a receptor and postural adjustment which will facilitate the reception of stimuli. Now these secondary areas, being motor in nature, may be responsible for orienting the receptors (or the structures bearing these organs) into a position conducive to the most effective stimulation. For example, an organism is touched on the skin. Impulses travel from the skin to somatic area I from which they are transmitted to somatic area II via intracortical fibres. The arrival of impulses in somatic II produces movements, for example, of arms, which could result in more effectual tactual stimulation. This may facilitate transmission of impulses to somatic area I, resulting in increased clearness or sensitivity to the impinging stimuli. The same kind of mechanism could operate in the case of audition and vision. Obviously this theory as it stands is too simple and needs considerable amplification to fit all the facts of attention and the neurophysiology of the cortex.

It has been mentioned previously that little use has been made of the physiological maps in research on localization of sensory function. At the present time, a series of experimental studies employing these maps is in progress at McGill. The aim of this research is to determine the role of somatic areas I and II in various tactual functions. Tactual functions were selected for study for three reasons: (1) We know most about the subordinate representation of various skin areas in the somesthetic cortex. (2) It is relatively easy to control the part of the receptor surface used by the animal in making tactual discriminations. (3) Not too much is presently known about the role of the cerebral cortex in tactual functions, especially in the lower animals.

Already we have considerable information on the role of somatic areas I and II in rough-smooth discrimination in the rat and cat. These experiments will be reported shortly. In addition to rough-smooth discrimination, a number of other tactual functions are, or shortly will be, under investigation. Among them are: (1) differential roughness discrimination; (2) discrimination of the shapes of objects, for example, wedges, cylinders, etc.; (3) temperature and pain discriminations. Through behavioural studies of this nature we may eventually acquire a better understanding of the function of somatic areas I and II. It is hoped that a similar attack will be made on the role of the other dual sensory areas.

In the preceding pages we have mentioned the great potentialities of the physiological maps for directing future research on the localization of sensory functions. In addition to performing this function, the maps

are invaluable in interpreting experiments already carried out. For example, French (4), employing a shock-avoidance technique, trained rats to discriminate clicks presented at a rate of five per second from clicks presented at one per second. Removal of the auditory cortex (as mapped by anatomical methods) produced serious disturbance of retention. Moreover, certain lesions outside the auditory area also produced some impairment. French was unable to explain this last effect satisfactorily. Inspection of the physiological maps immediately provides an answer—the lesions invaded auditory area II which in the rat is some distance anterior to the main auditory region.

Some of the data on the role of the cortex in tactual discrimination may possibly be clarified by reference to the physiological maps. It has been demonstrated that removal of somatic areas I and II in the cat (unpublished study of writer) and in the dog (1) produces permanent abolition of tactual discrimination. Head (7) and Evans (3) have shown that limited excisions in certain regions of the parietal lobe of man will produce permanent loss of somesthetic discrimination in the contralateral side of the body. However, ablation of the parietal lobe (composed of Brodmann's areas 3-1-2 and the posterior parietal lobule) in the monkey and chimpanzee (10, 11) produces no total abolition of cutaneous discrimination. It is inconceivable that losses of tactual functions should occur in the cat, dog, and man but not in the monkey and chimpanzee. A possible explanation of the discrepant results is that the primate studies employed anatomical maps of the somesthetic cortex which are quite different from the physiological maps. Although Brodmann's areas 3-1-2 closely correspond with somatic area I, the posterior parietal lobule and somatic area II do not even overlap. In view of this, it is possible that quite different results would be found in both monkey and chimpanzee if somatic areas I and II were ablated instead of areas 3-1-2 and the posterior parietal lobule. These are only two of the numerous problems that can be explained in the light of the differences between the two maps.

In conclusion, it may be of value to re-emphasize the importance of the electrophysiological mapping results for the general problem of localization of function in the cortex. The new maps provide a powerful tool for research in this area. They are excellent guides in the removal of functional cortical areas in localization experiments. By using them we may be able to throw some light on the problem of whether different sensory functions are localized in different sub-areas of the main sensory systems in the cortex. Moreover, these maps can be invaluable in clarifying localization experiments performed in the past.

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A CLOSED-FIELD INTELLIGENCE TEST FOR RATS¹

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IN 1946 Hebb and Williams (2) described a method of rating intelligence in the rat using a closed-field type of test apparatus. The present report describes the results of several studies which were aimed at refining and standardizing this test.

The closed-field test in its early form had been used in the psychology laboratory of McGill University, making available considerable data on the performance of rats in this type of test situation (4), (7). These data were collected and analysed to determine the discriminating value, the level of difficulty, and the reliability of each item. The results of this analysis were used to design several studies which tested the value of new items and which measured the effects of serial position on the items. The final step was to integrate all that had been learned about the test and to construct and standardize a more complete and satisfactory form of the test. The new test items were selected so as to: (i) sample a wide range of behaviour by the inclusion of a large variety of problems; (ii) obtain a series of items with a wide range of difficulty to aid in discriminating extremes of test behaviour; (iii) make the solutions independent of any particular location of the apparatus; (iv) result in a test having satisfactory reliability and discriminatory capacity.

APPARATUS

The closed-field apparatus consists of a box with an entrance alley and food compartment at opposite corners of an open field. This box is mounted on legs permitting the examiner to sit alongside the apparatus when testing animals. The details of the apparatus are shown in Figure 1.⁴

The floor of the box is made of $\frac{1}{8}$ " plywood and left unpainted, or is painted white. The walls are painted black and made from stock $\frac{1}{2}$ " \times 4" dressed lumber. There are thirty-six five-inch squares outlined in black on the floor of the open field. These serve to define error zones and also act as markers for placing the barriers. The barriers used to construct the problems are painted black and are made from stock $\frac{1}{2}$ " \times 4" dressed lumber. They are constructed so that, set on edge, they reach exactly

¹Some of the material in this paper is from a thesis submitted by the senior author in partial fulfilment of the requirements for the degree of M.A. in the Department of Psychology, McGill University.

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⁴The necessary details for construction of this apparatus are available in blue-print form from the author.

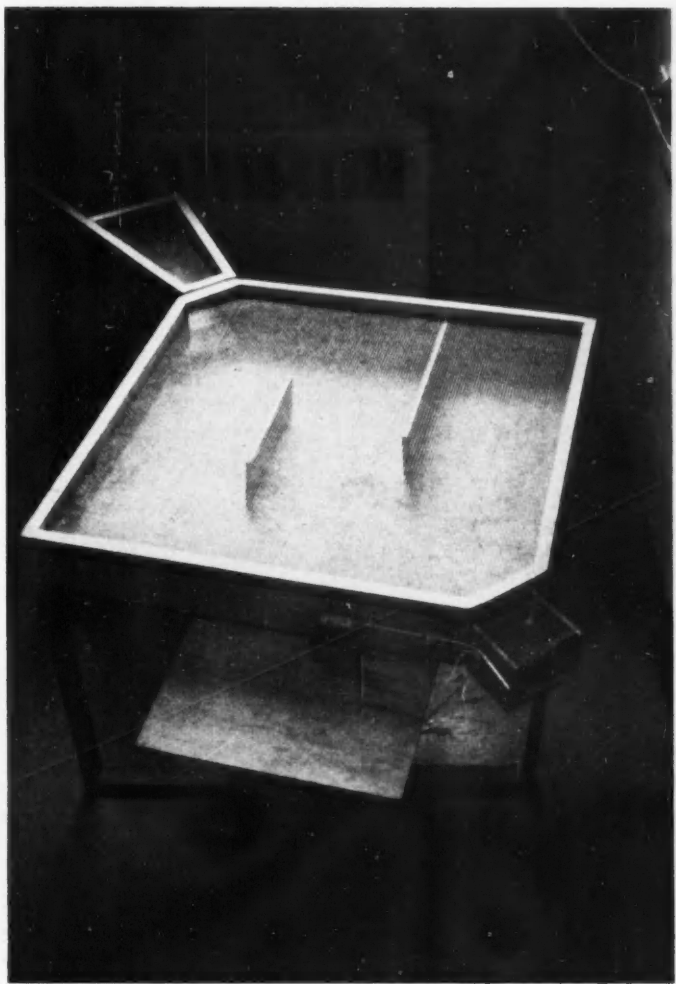
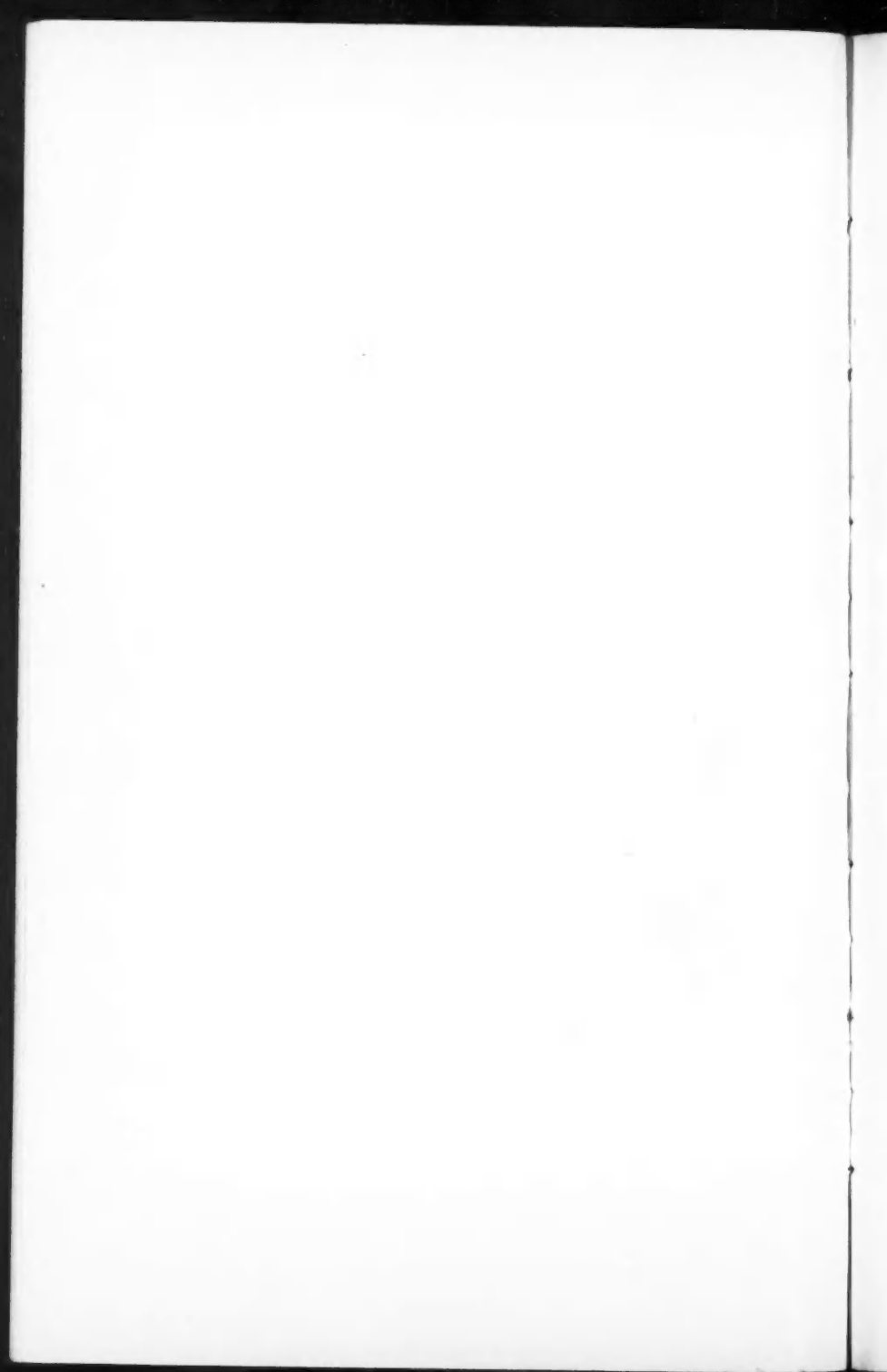


FIGURE 1. THE CLOSED-FIELD TEST APPARATUS.



from the floor of the box to the screen top. They are made to the following specifications: 3 barriers, each 5" long; 4 barriers, each 10" long; 3 barriers, each 15" long; 2 barriers, each 20" long; 2 barriers, each 25" long.

A small piece of sheet metal, 2" \times $\frac{1}{2}$ ", is nailed to the bottom of each barrier as a support to keep it standing on edge. To prevent the barrier from moving once the screen is fastened down, a $\frac{3}{4}$ " brad with head cut off is put into the top of the barrier at each end so that it engages the mesh of the screen top.

TRAINING PROCEDURE

The essential in the preliminary training is to teach the rat where in the box food is to be found, to adapt him to the apparatus and to handling, and to establish the habit of eating in the food box, so that when he is put into the entrance alley he will go to the food without fear and with a minimum of exploratory behaviour, in spite of changes in the position of the barriers.

Adaptation sessions. Problem A, as illustrated in Figure 2, is set up in the first adaptation session, problem B in the second, and so on until the series A to F is completed. The series is repeated until the rats run to the food compartment immediately upon being placed in the box.

At no time is the same training problem to be used on succeeding occasions. Having been deprived of food for ten hours, the rats are placed four at a time in the box and allowed to find their way around the barriers to the food compartment where they are allowed to eat moist ground food for forty-five minutes. Thereafter they are never fed in their home cages. Each adaptation period should last about an hour and there should be two periods a day.

Preliminary runs. As soon as the animals are eating well and give the impression of being well adapted to the box, they are run individually with as much handling as possible. Time is recorded from the moment the animal enters the apparatus until he takes his first bite of food. When he reaches the food he is allowed to take a few bites and is then replaced in the entrance alley and again allowed to go to the food, being timed as previously. This process is repeated nine times, twice daily, until all the animals reach the same criterion of adaptation to the apparatus; namely, making nine runs to food in a total of sixty seconds on two consecutive occasions. When an animal is not running as fast as it should, less total food should be given, otherwise each animal is allowed to eat for fifteen to thirty minutes after completing the runs in the apparatus. It was found that it saved time to have an eating place where an animal

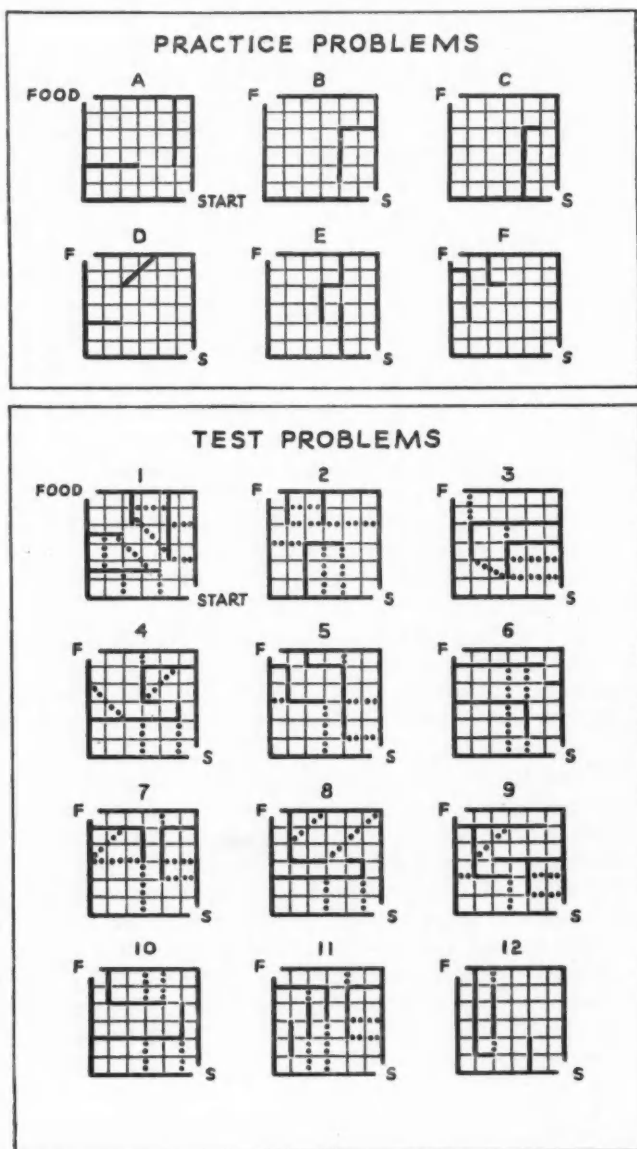


FIGURE 2. FLOOR PLAN OF TRAINING AND TEST PROBLEMS.

could be placed to eat the remainder of his food while another animal was being run in the apparatus.

It should not be expected that all rats will meet these training requirements at the same time. Those that do not should be given less food, extra handling, and several extra runs in the apparatus each session. In a group of animals there will be some that reach the criterion of adaptation earlier than the others. These should continue in the training but should be run only three or four times each period instead of the usual nine. These extra runs do not influence subsequent scores, neither are these precocious animals more likely to do better than the others or the subsequent test problems. Seven to ten days will usually be sufficient for this adaptation and training to be accomplished.

TESTING PROCEDURE

After about ten hours of food deprivation the animals should be given eight runs in the first problem situation and then allowed to eat outside their living cages for about fifteen minutes. Approximately ten hours later the same procedure is repeated with the next problem, continuing in this way until the twelve test problems⁵ as illustrated in Figure 2, numbers 1 to 12, have been completed. No days should be missed and it is desirable to keep all conditions as constant as possible.

In each test problem the animal's score is the total number of error zones entered. Time does not count. An error is scored each time an animal's two forefeet cross into an error zone. These error zones are indicated in Figure 2 by the broken lines. Where a blind alley contains two error zones (two broken lines), two errors are scored if the animal crosses the second error line, but no error is scored when he emerges from the alley through the first error zone. However, if an animal, having emerged from an error zone with both forefeet, turns about and goes back, a further error is scored. The total number of error zones entered by an animal in the twelve test items is that animal's score on the test.

Since even well-trained animals react to noises, movements in the room, and changes in the amount of lighting entering the testing room, it is suggested that these factors be controlled. It should also be noted that the animals adapt very easily to the presence of the experimenter seated at the apparatus, and probably use his figure as a cue in the problem solutions, making it inadvisable to change the experimenter's position during the testing period.

⁵Item 12 is slightly different from that used in the study. Subsequent work indicated that the original item was too difficult for a test, however appropriate it might have been as a learning problem.

STANDARDIZATION STUDY

This study was designed to establish the reliability and validity of the newly constructed test series.

Procedure. A group of 28 male hooded rats from the colony maintained in the comparative psychology laboratory at McGill University were divided into three groups and treated as follows:

(a) Nine rats were reared uneventfully in cages measuring $9" \times 10" \times 12"$, three per cage.

(b) Ten rats were reared similarly to those above except that at the age of ninety days these rats underwent cerebral cortex extirpation operations. The lesions were made in various cortical regions. None of the animals showed any gross motor or sensory defects at the time of testing.

(c) Nine rats were reared in a free environment similar to the one described by Hymovitch (3). In this environment the animals were able to move about freely in an area of approximately thirty cubic feet which contained various attempts to provide an "amusement park" for rats.

When the animals were one hundred and fifty days old they were started in the closed-field apparatus according to the above schedule of training. After eight days of preliminary training the entire group had reached the required criterion of nine runs in sixty seconds on two consecutive occasions. This amounted to thirteen exposure periods of thirty minutes each and three individual run sessions. The animals were then tested with the twelve test items, two problems being given each day about ten hours apart. No days were missed and in six days the test series was completed. The animals were returned to their cages and put on a regular feeding schedule.

For three days the rats were fed and watered in the usual fashion. On the fourth day the entire group of animals was put back on a closed-field test training schedule. This time the preliminary training took two days, two exposure periods of thirty minutes each on the first day followed by two criterion run sessions the next day. Training problems A, B, C, D were used to bring the group to the required criterion. All the rats were then tested as previously except that this time the problems were presented in their mirror-image form. This was done to counteract any direct memory of the test solutions. It is felt that this is an unnecessary precaution and that the test items in their original form would have yielded identical results.

RESULTS

That the closed-field method is useful in discriminating animals that have suffered cortical damage and also those that have been reared in

"superior" environments is shown in Table I. The normals are significantly inferior to the rats exposed to superior environments but superior to those that were operated on. These findings agree with the reports of Lashley (5) and others on the effects of rat brain extirpation as well as with the results obtained by Hymovitch (3) in working with free environment rearing.

TABLE I
TEST AND RETEST MEAN SCORES OF THREE GROUPS

Group	N	Test Mean	P value of Diff.	Retest Mean	P value of Diff.
Operates	10	159.5		95.9	
Normals	9	102.2	(O-N) <1%	66.0	(O-N) <1%
Free Environment	9	88.0	(N-F) 10%	43.6	(N-F) <1%

Table II indicates the test-retest reliability obtained with the closed-field test. When all animals are compared on test-retest scores the correlation (Rho) equals .84; when only the unoperated scores are considered Rho is .80. It should be noted that this reliability and the ability of the test to differentiate the experimental groups in both the test and the retest may also be an indication of validity; despite the marked degree of learning (shown in the lowered means in retesting), those animals which were poorest on the first test tend to be poorest on the second.

TABLE II
CORRELATION OF TEST-RETEST SCORES

	N	Rho
All Animals	28	.84
Normals	18	.80

DISCUSSION

The results reported in this paper regarding the closed-field intelligence test for rats indicate that it is a reliable instrument and compares very favourably with traditional measures of rat intelligence. Miles (6) in comparing the elevated and alley mazes reported reliabilities of .75 and .73 respectively. Burlingame and Stone (1) reporting on the multiple-T maze obtained a reliability of .78. These were actually odd-even reliabilities, and no one has found anything like as high a correlation between two independent learning scores in a test-retest procedure with alley or elevated maze. The study described in this paper was able to

achieve a reliability of .84 for a group of twenty-eight rats, including ten that had cortical damage. The results also indicate the ability of the instrument to discriminate fine experimental variables. On inspection of the brains which were removed from the animals that had cortical damage, no extirpation seemed to exceed 10 per cent of cortical tissue and several were rather small.

It should be noted that the closed-field test described in this paper bases its quantitative score on qualitative analyses of performance on twelve different tasks. This is a deliberate attempt to evaluate rat intelligence as a more general and integrated phenomenon than has been done in the past, and in this way to accomplish the measurement of a capacity in the rat which more closely approaches our concept of intelligence in man.

SUMMARY

This paper describes the apparatus and test items of a closed-field test of rat intelligence. This method is adaptable to other animal species and has the important advantage of measuring intelligence by analysis of qualitative behaviour rather than by inference from learning scores. Data indicating the reliability and validity of the method are presented.

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A NEW CLOSURE TEST¹

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THE senior author has prepared a new closure test of the Gestalt completion type. This test may prove of interest to those engaged in experimental studies in the field of perception or in clinical studies of personality. The test is in the form of a printed booklet with a separate answer sheet, and is designed for group testing or individual use.

The present test is a development of a test first created and used by R. F. Street (4). Similar types of test material have been used for experimental purposes by Leeper (2), Sheehan (3), Verville and Cameron (6), Verville (7), Thurstone (5), and Guilford and Lacey (1). The test material used by these investigators was for the most part presented tachistoscopically, and did not lend itself readily to group-testing.

The intention here was to develop a test which was more extensive in scope than previous tests of this type and which could be administered either on an individual or group-testing basis. Further, the intention was to develop an instrument which would adequately satisfy the usual testing criteria of internal consistency, discriminatory capacity, and the like. It was felt that the development of such an instrument would facilitate subsequent investigation on the nature of the closure phenomenon, and on the relevance of the ability measured by this type of test to performance in various practical situations.

The present closure test is regarded as measuring the facility with which individuals can apprehend the structural implications of a confused or incomplete visual configuration. Thurstone in his factorial analysis of tests of perception (5) identified a factor which was referred to by him as speed and strength of closure. Thurstone's hypothesis was that this factor represented the ability to form a closure in a given presentation and that the factor was best represented when the subject was required to form a closure against some distraction. It is probable that this factor identified by Thurstone is well represented in the present closure test.

Very little is known about the usefulness of this type of test material in the clinical or other applied fields. While it is possible to speculate at length with regard to the fundamental nature and the importance of the abilities involved in test material of this type, it is clear that until further experimental evidence is available such speculation will be undertaken at considerable risk. The initial step in the gathering of such evidence is,

¹This paper is a brief report on part of a project carried out under the auspices of the Defence Research Board, Ottawa, Canada.

of course, the construction of a test which conforms to an acceptable degree to the criteria of measurement. This is the task we have undertaken here.

The test contains forty items, preceded by four practice items. The pictures are $4" \times 6"$ in size, in a $5\frac{1}{2}" \times 8"$ ring-bound booklet, presented one to a page, with the word TOP printed above each to show the correct orientation. Some of the pictures present the elements of the portrayed object as white figure on black ground, others as black figure on white ground. In some, all the presented material is requisite to the completed structure; in others there is material irrelevant to the completed structure. Again, the actual graphic treatment varies from picture to picture; a clean-cut presentation in solid blacks and whites being followed by a confetti-like presentation, or an arrangement in spindly lines, and so on. The items are not arranged in order of difficulty. Samples of the items are presented in Figures 1 to 4. Figure 1 is a couple dancing, Figure 2 a telephone, Figure 3 an airplane, and Figure 4 a little boy and girl.

For group presentation the testing time is twenty minutes. Each subject has a booklet and is permitted to work through the items in any order. Subjects are advised when half-time has elapsed. Answers are written in a few words descriptive of the object seen on numbered lines on separate score sheets. Scoring is on the generous side—in the sense that an answer which substantially approximates the to-be-seen object or arrangement is scored *one*; but "part" answers are not accepted, neither are "imaginative" answers. The administrative instructions contain, for each item, several examples of acceptable and unacceptable answers. Of the acceptable answers, those which characterize the performance of persons scoring high on the test have been especially noted as the clearest or "best" answers.

Data available at present on the use of the test results from the testing of 103 university students (62 men and 41 women; mean age 20.5 years). The mean score obtained in this sample was 17.21, and the standard deviation of scores, 7.32. No significant sex differences were observed. The reliability of the test determined by Kuder-Richardson formula 20 was found to be .88. This is fairly satisfactory in relation to the number of items. Biserial correlations between the individual items and total test scores were calculated. These correlations have an average value in the neighbourhood of .6. The highest item-test correlation obtained was .84. The item-analysis indicates that four items might be discarded either on grounds of extreme difficulty or poor discriminatory capacity.

What is currently known about this type of test material indicates that the ability to effect the required closures is a distinctive capacity possessed by individuals in markedly different degrees and is capable of



FIGURE 1

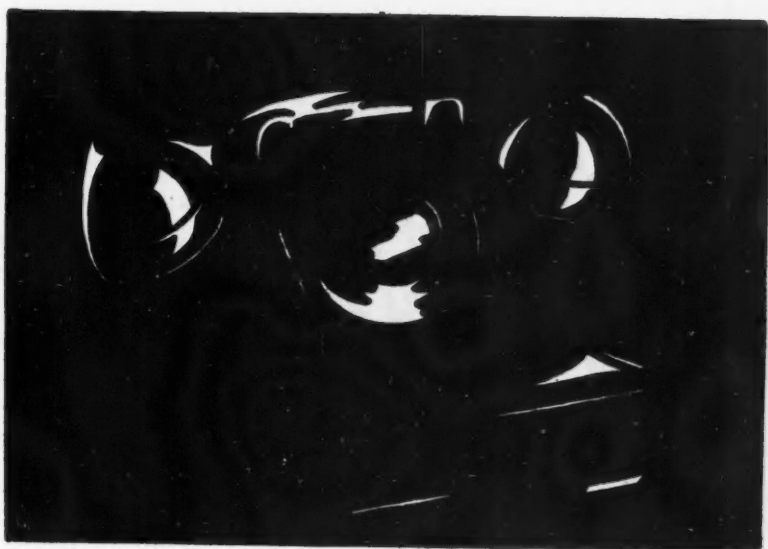


FIGURE 2

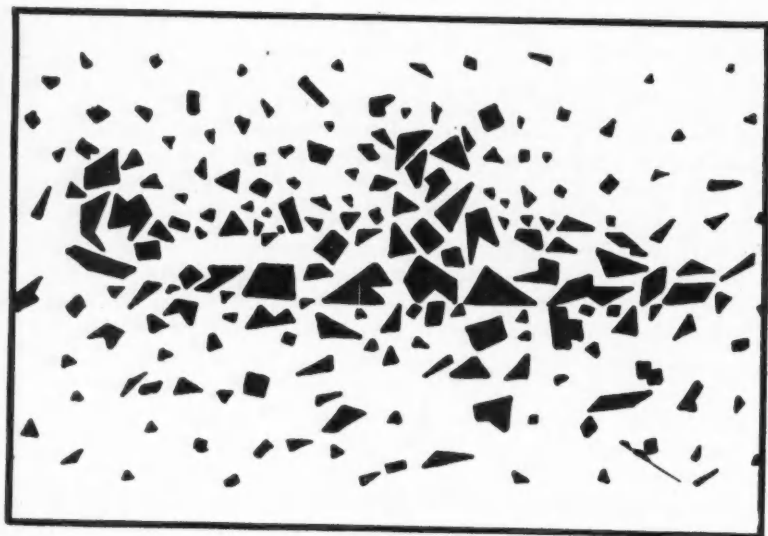


FIGURE 3



FIGURE 4

straightforward measurement. Certain individuals experience great difficulty in effecting any closures at all, and cannot effect such closures when the item is explained to them and the object traced out. Other individuals can effect the required closures with facility. Effecting the closures is for many subjects a pleasurable experience. Sudden smiles and exclamations of satisfaction are quite common during the testing session. A few subjects find the exercise peculiarly aggravating. Generally, once the pictures are "seen" they are henceforth obvious. These closures appear to be instances of a form of simple insight at the perceptual level. They cannot be "reasoned out," nor is there any device whereby they can be wilfully effected. An "insight" comes or it does not; it may come at once, in one instance, or belatedly in another. Little more can be said at this stage. The theoretical and practical implications of this type of test material await further study.

Copies of the test may be obtained, for experimental purposes only, from the Department of Psychology, McGill University, Montreal, Quebec.

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PERSONALITY FACTORS ASSOCIATED WITH PARAPLEGIA AND PROLONGED HOSPITALIZATION: A CLINICAL NOTE

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ALTHOUGH several authors have discussed the "psychological problems" of paraplegia (5, 6), no report of a psychometric investigation of this disability could be found in the literature. The use of the Rorschach test to corroborate clinical observation gave evidence of severe anxiety, sexual conflicts, and other neuropsychiatric traits among amputees (4). Some personality change was noted in 62 per cent of these cases.

To determine what personality change occurred following disability, the Rorschach and the Goodenough "Draw-a-Man" tests were administered to a group of 22 paraplegic patients hospitalized and undergoing treatment at Ste. Anne's Military Hospital.¹ A control group was utilized in an attempt to allow for, or discount, the effects of prolonged hospitalization. The cases were matched pair by pair for measured intelligence (Wechsler-Bellevue) with a group of patients recovering from pulmonary tuberculosis. It should be noted that these latter cases had suffered no outwardly visible mutilation of the body and were justly confident of their imminent recovery.

It might be assumed that the patients were relatively normal prior to injury or illness since they had passed army induction screening and had adjusted reasonably well to military life. Injury provided a type of random selection. All cases were male veterans of middle age (range 20-38) receiving a disability allowance during their entire prolonged hospitalization. The patients were found to be of average I.Q., with the exception of 5 in each group, who were of superior intelligence.

RESULTS

Of the 20 paraplegics able to perform the Goodenough "Draw-a-Man" test (2 were quadriplegics), 6 absolutely refused, and 4 drawings displayed an extreme distortion of the human form. Schilder and Bender have stated that such features reflect individual problems in the field of body image concepts. Thus, 50 per cent of the experimental group show, through this test, sign of psychopathology. There were no refusals among the control group.

Appraisal of the individual Rorschach records revealed that their distribution of response determinants was generally consistent with the

¹The study was conducted with the consent and encouragement of Dr. Gustave Gingras, Director of Physical Medicine, Montreal District, Ste. Anne de Bellevue, Quebec.

additive protocol of the group as presented in Table I. While the present discussion will largely bear reference to the test performance of the paraplegic group, it may be seen to apply almost equally to that of the tubercular group. (Significant differences are shown by *P* values of .05 or less, very significant differences by *P* values of .01 or less.)

TABLE I

MEAN DISTRIBUTION OF RORSCHACH RESPONSE DETERMINANTS FOR THE
PARAPLEGIC AND TUBERCULAR GROUPS

Response determinant	Paraplegia		Tuberculosis		P	Deviation
	Total	Mean	Total	Mean		
M	28	1.3	43	2.0	.11	few M, particularly paraplegia
FM	80	3.6	83	3.8	—	FM > M
m	12	.5	7	.3	.16	
k + K	23	1.0	24	1.1	—	m, k + K ?
FK	18	.8	4	.2	.001	
F	257	11.7	231	10.5	—	F% = 49.5 and 48.0
Fc + c	45	2.0	44	2.0	—	(Fc + c + C') > (FC + CF + C)
C'	7	.3	3	.2	—	
FC	33	1.5	22	1.0	.30	Sum C low, but VIII, IX, X% = 34.5
CF + C	16	.7	20	.9	.32	
TOTAL	519	23.6	481	21.9	—	
Anatomy	25	1.1	17	.8	.31	
Rejection	26	1.2	22	1.0	—	particularly VI and VII in paraplegia

A total of 519 responses was given by the paraplegic group, or an average of 23.6 per patient, which is within the lower limits of the normal average range. This might indicate some limitation of the mental productivity of the group.

The limited capacity for critical evaluation (*d* = 4%) was further illustrated by the noticeable lack of elaboration throughout most records, especially the W responses, many of which were vague or crude in nature (also few F+). This was interpreted as an indication of an evasive attitude. A tendency to heightened emphasis of unusual responses (14%, largely S) suggested some elements of opposition to the self. Those paraplegics, however, who still retained some sexual capacity, five in number, gave no responses within the unusual locations. The group, nevertheless, showed enough practicality to remain in good contact with reality (*D*% = 54, *Popular*% = 21).

As the F column comprised very nearly 50 per cent of the total number of responses, most other determinants were correspondingly reduced.

This is pointed evidence of the constriction and inhibition present in the group, these patients being inclined to repress or control their more personal or spontaneous reactions.

Since the average response time of 99.5 seconds differs significantly from the norm in being of considerably greater duration (3), we should expect the form level to be accordingly high, but there was a definite lack of elaboration, that is, of F+ responses (see also d%). This inconsistency demonstrates that the intellectual control is not refined, or on a compulsive basis, but rather is of an evasive, anxious, and inhibited nature.

A poverty of inner life (few M) is common to records of inhibition where the creative capacities have been hampered and hence the variability and scope for action narrowed. A certain immaturity is reflected in the ratio of FM > M.

The fact that the group seems to possess adequate drive (FM), but a limited emotional response (sum C), suggests the possibility of some inverted aggression (see above, DdS) and is probably the consequence of the paraplegic state having taken from most of these patients any possibility of gratifying their instinctual drives sexually—to say nothing of locomotor paralysis, etc. (see below, rejection). The tendencies to tension and anxiety seen in the m, k, and K responses were found to be markedly less among those patients still retaining some sexual capacity. Though the number of anatomy responses are not unusually pronounced, they reflect some degree of concern with bodily function.

Caution in emotional contacts is shown by the higher ratio of achromatic to bright colour responses, $(F_c + c + C') : (FC + CF + C)$. While the group is responsive to stimuli from without ($8910\% = 34.5$), less than 30 per cent of these responses involved the use of colour, or affect.

A final demonstration of the inhibition seen in the group is revealed by the number of cards failed or rejected. This limitation of ideational productivity was most noticeable in the greater proportion of rejections of cards VI and VII, and may indicate sexual conflict.

By use of an objective or sign approach to the Rorschach, it is also possible to demonstrate the presence of neurotic tendencies among the paraplegics examined, namely:

1. M seldom more than 1
2. FM generally larger than M
3. FC usually not more than 1
4. increased resistance to the use of colour
5. tendency to constriction, high F%
6. rejection of cards, particularly VI and VII

Thus, inhibition, conflict, anxiety, rigidity, and immaturity of thought were the predominant psychopathological traits. They are related to clinical counterparts and are a serious problem in the earlier stages of treatment.

Interestingly, even though all members of the control group had been assured of their recovery and imminent discharge from hospital, their Rorschach records were inferior to the group of "recovering" pulmonary tubercular patients as reported by Ellis and Brown (2). In particular, the productivity (R), creativity (M), and rejections were less favourable. While the control group of patients suffering from pulmonary tuberculosis was originally included in an attempt to account for the influence of prolonged hospitalization, it was found to differ little from the experimental group. The fact that the numbers of FM and CF responses are similar for the two groups (responses generally considered indicative of the more immature, impulsive, or spontaneous reactions), that FC is greater than CF, and that the F% is nearly to the level of constriction, concurs with the more recent clinical belief that tuberculosis (with the exception of terminal stages) does not lead to concomitant euphoria (1).

The lack of any extensive differences in the test performances of the two groups suggests that the psychoneurotic traits observed are probably a reaction relatively normal to prolonged hospitalization and the resultant restriction of activities, physical dependence, etc.

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BOOK REVIEWS

Soviet Psychiatry. By JOSEPH WORTIS. Toronto: Burns and MacEachern, 1950. Pp. 314. \$5.75.

WE have long awaited an authoritative account of the mental sciences in contemporary Soviet Russia. Dr. Wortis' book is an honest attempt to provide this account. No mere statistical summary, this book traces the development of the theories and practices of psychology and psychiatry in Russia from the time of the Revolution to the mid-century. The basic assumptions, beginning with "dialectic materialism," are clearly stated and the directions and growth of scientific thought in the field of human behaviour fully described. The author gleaned his material from over 7,000 abstracted and digested references from the Soviet neuropsychiatric literature. He approaches the study in a "spirit of sympathetic interest; the Soviet scientists are credited here with an earnest regard for human welfare and their trials, tribulations, uncertainties, reversals and victories are on the whole credited with worthy aims." He does not, however, agree with all the things that Soviet psychiatrists say and he points out that they do not always agree with each other. Soviet psychiatry is shown here as related to its three basic sources of influences: (1) its socialistic setting in a broad framework of public health services; (2) its conformity with the general principles of dialectic materialism; and (3) the teachings of Pavlov.

The Soviet psychiatrist calls himself a materialist. By this he means that he regards mental phenomena as derivative from, and secondary to, material processes. He thus places himself squarely in opposition to the philosophic idealists. Nevertheless, he "would not want to be regarded as a naive or . . . mechanical materialist." He is much happier thinking in terms of "levels of integration" and the inter-relation of these levels. For him "every phenomenon in nature has its own internal system of interacting and opposing qualities which give the phenomenon both its dynamic equilibrium and properties of growth and motion." Again "conglomerates assume qualities different and distinct from the qualities of their component parts. . . . A society of human beings acquires properties and modes of behaviour which are different from its individual parts." The Soviet psychiatrist and social scientist is very critical therefore of those psychological theories which seek to explain social movements or conditions in terms of individual psychology. This explains at least in part his impatience with statements such as the one commonly quoted from the UNESCO charter, "Wars begin in the minds of men and it is in the minds of men that we must build the defences of peace."

The Marxian emphasis on the unity of thought and experience, of theory and practice, has had important effects on psychological theory. Experience is always active, not passive; it requires the participation of the subject. Hence the Soviet scientists are profoundly distrustful of theoretical formulations which have been fashioned in ivory towers, of scientists who lose contact with the practical application of their science, or the theories of life propounded by social classes which have divorced themselves from productive work. Thus the problem of relating the psychology of man to his mode of existence becomes one of the main concerns of the Soviet psychologist.

A similar insistence on the close relation between an individual's ideas and his social experience explains why the Soviet psychologists do not place an undue emphasis on childhood experiences nor do they limit the period of growth and development to the early years. Day-to-day experience determines thinking and attitudes, not the repressed psychic traumata of preschool years.

In reviewing the achievements of Soviet psychology the author is able to point to several areas where significant advances have been made. It is pretty evident that a considerable body of knowledge has been established on the neuro-physiological processes immediately underlying mental activity. Topics which have been studied include the function of the frontal lobes in perception; the nature of hemispheric dominance; the relationship of dream content to frontal lobe lesions; and the function of certain "silent" areas of the brain such as the parietal and cerebellar cortex. All this work had great practical value in the diagnosis and treatment of brain injury during the war.

In the field of perception, much valuable work has been done with regard to the mutual inter-action of various sensory functions. For example, it was found that visual sensitivity could be enhanced if other sensory functions were stimulated. This proved to be valuable in military night-vision work.

The work on personality has been directed mainly toward three problems: human abilities; personal interests and aspirations; and the problem of character. As one would expect, Soviet psychology refuses to regard human abilities as being basically dependent on heredity or constitution factors. Specific abilities are invariably regarded as the products of a complicated process of development based, to be sure, on biological predisposition, but determined mainly by the concrete activity, training, and education experienced by the individual.

Again in the field of psychiatry, it is clearly obvious that theory and practice have been influenced mainly by Pavlovian psychology rather than the "dynamic schools." This leaning toward Pavlovian psychology

has strengthened the experimental and medical tradition in psychiatry and taken it almost completely out of the field of social issues. Electric shock treatments are easily accepted as routine in Russia and results are explained on a physiological rather than psychological basis.

The organization of psychiatric facilities in Soviet Russia is very interesting. The aim has been to try as many treatment patterns as possible *outside* the hospital setting, in colonies or in supervised occupational activities. No patients are sent to hospital unless it is absolutely essential for their own protection or the protection of their families. And even within the hospital a maximum of freedom and productive activity is encouraged. Wherever possible, the patient is allowed to continue at his accustomed work. Soviet psychiatrists estimate that only about 30 per cent of mentally ill people require hospital treatment, and even in these cases only temporary hospital care is given. Every effort is made to return the patient to his usual environment as soon as the acute phase has passed. The unhospitalized psychiatric patient is under the care of the district psychiatrist, and is looked after on an out-patient basis. This accounts for the striking contrasts in the number of general hospital beds as compared with beds for mental illness. It is estimated that the U.S.S.R. has about as many general hospital beds available per capita as the U.S.A. On the other hand the number of beds devoted to nervous and mental diseases has dropped from 4.1 per cent of the total hospital beds in 1928 to 1.8 per cent in 1941. In spite of this, the Soviet authorities claim that no psychiatric case is turned down for lack of accommodation.

Each psychiatric hospital is required to have a separate department for children; and a department for veterans. The hospital facilities stress the strictly medical and physiological orientation of psychiatry and are fully equipped for electric shock, insulin and sleep treatment, pharmaceutical treatment with drugs of various kinds, physio-therapy, psycho-therapy, and occupational therapy. In general it is considered expedient to build two or three small hospitals rather than one very large mental hospital. In most cases the mental hospitals are equipped to handle 150 to 250 patients receiving active treatment. They also have facilities for some chronic cases. Of course the psychiatric facilities are still unevenly distributed and there are many districts where the psychiatric facilities are minimal. In addition to the district psychiatrist, psychological personnel comprises chiefly psychiatric nurses. There are no social workers in the U.S.S.R. Trade unions administer all the welfare and social security funds, organize and operate the small camps, and look after rehabilitation and vocational placement.

As might be expected, psychotherapy in Soviet Russia is a pretty forthright procedure. It consists mainly of a direct appeal to rational, conscious thinking by means of persuasion, the use of group pressures, and positive incentives. Suggestion and hypnosis are occasionally used to reinforce these direct appeals. Repetition and conditioning naturally are used. Reference has already been made to the considerable emphasis placed on occupational and work activities.

Child psychiatry is emerging as a sub-specialty of general psychiatry with special problems and techniques adapted to the growing organism. Numerous educational and cultural influences now support the dignity and stability of family life and these are recognized as important contributions to the feeling of security for the growing child. Moreover there is a deliberate effort made to promote at the earliest possible age a feeling of integration into the larger social group beyond the family circle. The philosophy of child care very briefly is: "We try to make every child feel that he is wanted, is needed, and has a home." Strangely enough, schools have begun to place a great deal of emphasis on the individual child. For example, teachers-in-training work intensively for a period with two children, one achieving normally, the other an educational problem. The student teacher is advised to study the interests and attitudes of these children, their social relationships, nervous temperament, and personality, as well as their family life. By comparing these children, teachers learn the ways and means of helping the child who has difficulties.

"Freedom" and "self expression" have been discarded as unworkable in the educational system. Sterner attitudes toward behaviour have developed. There is now more emphasis on competitive incentives (within a socialist framework, of course) and a general increase in social discipline. Twenty rules of behaviour for school children have been issued. Various grades of punishment are provided for a violation of these rules up to and including expulsion in rare instances. Physical or corporal punishment is forbidden and appears to be non-existent in Soviet schools. "Love of work" and "love of people" are the cardinal virtues. The problem of maladjusted school children is not regarded as widespread or serious in Russia. Child guidance is really a branch of pedagogy and in general is the concern of teachers. Only when a disturbance becomes so serious that it is easily recognized as a psychotic disturbance is it likely to be referred to the psychiatrist.

Space precludes the consideration of many other interesting chapters in this book, including an account of Clinical Psychiatry and Treatment; Research; Morality and the Law; and an Appendix including several un-

abridged articles by outstanding Russian psychiatrists, apparently translated by competent people. These enable the reader to come into closer contact with the scientists who are determining psychiatric and psychological policy. There is a good subject and author index which in a book of this nature is essential.

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Religious Beliefs of Youth. By MURRAY G. ROSS. New York: Association Press, 1950. Pp. xviii, 251. \$3.00.

THIS book, which is introduced with an appreciative foreword by Professor Gordon W. Allport, is the result of a study-project sponsored by the National Council of the Y.M.C.A. in the United States with the hope of determining the structure and function of the religious beliefs of young adults in American society today. Religion is defined as "human recognition of superhuman controlling power, and especially of a personal God entitled to obedience"; and it is assumed that such a religion gives zest, warmth, and power to life and personality. Using a questionnaire sample of 1,935 youth, intensive personal interviews with 100 young people, and group discussions in which 869 different individuals participated, Dr. Ross and eight co-workers set before themselves four specific objectives: (1) to determine the religious "position" of young people in the Y.M.C.A.; (2) to determine the "meaningfulness" of the religious position; (3) to discover the relationship between "religious position" and "position" on characteristic social problems of our day; and (4) to discover if youth have "felt needs" that impinge on the religious field and, if so, what these are and how the Y.M.C.A. may deal effectively with them.

The research sample was selected from the Y.M.C.A. constituency between the ages of 18 and 29 (inclusive) in 11 representative north-eastern cities ranging in population from under 50,000 to over 500,000. The replies to the questionnaire were given a rigorous statistical analysis, the results of which are presented in 66 tables. As a means of providing a broader perspective of religious attitudes and practices in the larger community setting, Dr. Ross compares and contrasts his findings with evidence from seven other studies including Allport, Gillespie, and Young's *Religion of the Post-War College Student*, the Lynds' *Middletown in Transition*, Hollingshead's *Elmtown's Youth*, and Watson's *Youth After Conflict*.

Seven of the 12 chapters of the book are devoted to a detailed pre-

sentation of the rich and absorbing data derived from the survey, followed by a general summary of the conclusions that may be drawn. While religion is not completely devoid of meaning in the lives of the respondents, Dr. Ross finds much mere verbal assent to religious traditions, many echoes of childhood fears, considerable irrational doubt, and a ubiquitous emotional and intellectual immaturity. There is a great discrepancy between religious beliefs and religious practices: the dominant attitudes of youth are concerned essentially with successful adaptation to the current secular mores of American society—"religion has almost ceased to provide a significant or lofty ideal which gives life purpose and direction" (p. 149). For the majority of the sample, the principal emphasis in life is on economic security and social respectability, with all "the glamorous little details provided by current magazine advertising." A desire for "security by encapsulation" has led three-quarters of the sample to a sense of impotence, a feeling that their individual lives are not very important "in the larger scheme of things." The report lends a certain weight to the view that religion is a companion of conservatism: the "less religious" are more willing to support "radical" measures for social and economic reform.

Dr. Ross concludes: (1) that less than six per cent (some of whom are theists and some atheists) of the group can be described not only as "well-adjusted" but also as "mature" and "creative" personalities; (2) that less than 14 per cent are deeply religious persons; and (3) that approximately 80 per cent, while "assenting to" orthodox religious concepts, are confused, torn by conflict, uncertain. The members of the third group lack in varying degrees adequate personality structure and development: they are "individuals whose goal structure is narrow, whose ego structure is weak, and whose life adjustment is less than adequate" (pp. 155-6).

As the research on which this book is based was sponsored by the Y.M.C.A., Dr. Ross is naturally concerned with the future contribution of that institution to the critical situation which his report documents so comprehensively. After stating his own philosophy and concept of human nature in terms which many psychologists will not find uncongenial, he explores the potential value to the Y.M.C.A. of such contemporary techniques as non-directive interviewing, sociodrama, group therapy, and participant discussion. Psychologists will be especially interested in his recommendation that the Y.M.C.A. should emphasize counselling much more in future than it has in the past. He is well aware that such counselling must be selective and that it will require for its success a carefully trained personnel.

An outstanding merit of this study is the extraordinary skill with

which statistical data are supplemented by revealing excerpts from individual interviews to provide a luminous picture of the religious beliefs and attitudes of contemporary American youth. Psychologically considered, however, the study has three important limitations. First, is the Y.M.C.A. constituency within a 500 mile radius of New York a representative sample of young people in the United States at the present time? Second, does not the content of the questionnaire create a methodological problem in that it provides an inadequate basis for comparing the effectiveness of the church's influence with that of other social institutions? Third, the conceptual framework, in terms of which the data are interpreted, is not tightly articulated: Dr. Ross has scarcely achieved a synthesis of the psychological and psychiatric approaches which he takes over, somewhat uncritically, from such writers as Lewin and Krech and Crutchfield on the one hand, and Fromm on the other. Again, the belief that New Testament views regarding human nature are supported by modern psychiatry lends a certain ambiguity to the use of such key adjectives as "mature," "adjusted," and "creative." This criticism might, however, be turned in Dr. Ross's favour: inspired by a sensitive and discriminating approach to religion, and enjoying the advantages of a functional role, a trained investigator has shown how contemporary theories of personality "look" in the context of the Y.M.C.A. Purists in scientific circles who detect a measure of religious bias in Dr. Ross's more interpretative sections will derive no consolation from criticisms which he will receive in other quarters for his liberalism and humanity.

Philosophers and social scientists, as well as psychologists, will find the last three chapters of the book especially stimulating. In discussing the implications of his findings for the future programme of the Y.M.C.A., Dr. Ross has made a contribution to the contemporary effort to relate science to values, knowledge to action. Here, again, while workers in various fields may find much to challenge in his treatment of this controversial problem, all will profit from a careful study of his methods and proposals. This is a worthwhile book which deserves to be widely read in Canada.

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